



AMENDMENT

Please enter the following amendments:

RECEIVED

JUL 10 2001

TECH CENTER 1600/2900

IN THE CLAIMS

Cancel claims 1-6, 15 and 22 without prejudice or disclaimer.

Please amend claims 16, 21 and 23 as follows:

5 16. (Twice Amended) A method of carbon monoxide hydrogenation comprising:

(a) providing a catalyst structure in a reactor, wherein the catalyst structure comprises a porous structure having a catalyst thereon, wherein the catalyst structure comprises a pore size of at least 0.1 μm , and wherein the catalyst structure comprises a foam, felt, wad, or combination thereof;

(b) passing a feed stream comprising carbon monoxide gas and hydrogen gas through the catalyst structure; and

(c) heating the catalyst structure to at least 200°C;

wherein the feed stream has a residence time in the reactor of less than five seconds; and

wherein a product stream is obtained that exhibits the properties of at least a 25%

conversion of carbon monoxide and at most 25% selectivity toward methane.

10 21. (Amended) 9. The method of claim 20 wherein the metal foam has pores that range from 20 pores per inch to 1000 pores per inch.

33
~~23~~

(Amended)

22

The method of claim ~~35~~ further comprising a catalyst layer deposited on the interfacial layer.

Please add claims 25-45 as follows:

11
~~25~~

The method of claim ~~10~~ wherein the porous support has 80 to 1000 pores per inch.

12
~~26~~

The method of claim ~~10~~ wherein the feed stream follows a tortuous flow path through the catalyst structure.

13
~~27~~

The method of claim ~~26~~ wherein the porous support has 80 to 1000 pores per inch.

14
~~28~~

The method of claim ~~26~~ wherein the interfacial layer is continuous over the first pore surface area.

15
~~29~~

The method of claim ~~26~~ wherein the residence time is from 1 to 2 seconds.

16
~~30~~

The method of claim ~~26~~ further comprising a catalyst layer deposited on the interfacial layer.

C 4

17
~~31~~

The method of claim ~~25~~ wherein the interfacial layer is continuous over the first

pore surface area.

~~18~~₃₂ The method of claim ~~18~~⁵ wherein the ratio of hydrogen to carbon monoxide ranges from 1.5:1 to 3.5:1.

~~19~~₃₃ The method of claim ~~16~~⁵ wherein decreasing the pressure at the same temperature and pressure corrected residence time, results in decreasing methane selectivity.

Rule
1.126 ~~20~~₃₃ The method of claim ~~16~~⁵ wherein decreasing the pressure at the same temperature and pressure corrected residence time, results in increasing conversion %.

~~21~~₃₄ The method of claim ~~20~~¹² wherein decreasing the pressure at the same temperature and pressure corrected residence time, results in increasing conversion %.

~~22~~₃₅ The method of claim ~~16~~⁵ wherein an interfacial layer is disposed on the porous structure, wherein the porous structure has a pore size greater than 0.1 μm , and wherein the interfacial layer has a pore size less than that of the porous structure.

~~23~~₃₆ The method of claim ~~25~~²² wherein the porous structure is a coherent structure.

~~24~~₃₇ A method of carbon monoxide hydrogenation comprising:

(a) providing a catalyst structure in a reactor, wherein the catalyst structure comprises a

porous structure and a porous interfacial layer disposed on the porous structure, wherein the porous structure has a first pore size of at least 0.1 μm , wherein the porous interfacial layer has a second pore size less than the first pore size;

(b) passing a feedstream comprising carbon monoxide gas and hydrogen gas through the catalyst structure; and

(c) heating the catalyst structure to at least 200°C;

wherein the feedstream has a residence time in the reactor of less than five seconds; and

wherein a product stream is obtained that exhibits the properties of at least a 25% conversion of carbon monoxide and at most 25% selectivity toward methane.

~~25~~
~~37~~ 38. The method of claim ~~24~~ 37 wherein the feedstream follows a tortuous flow path as it passes through the catalyst structure.

~~26~~
~~39~~ 39. The method of claim ~~25~~ 38 wherein the interfacial layer is continuous.

~~27~~
~~40~~ 40. The method of claim ~~25~~ 38 wherein the residence time is from 1 to 2 seconds.

~~28~~
~~41~~ 41. The method of claim ~~25~~ 38 wherein the porous structure comprises a foam or felt.

~~29~~
~~42~~ 42. The method of claim ~~28~~ 41 wherein the foam, felt or wad has 80 to 1000 pores per inch.